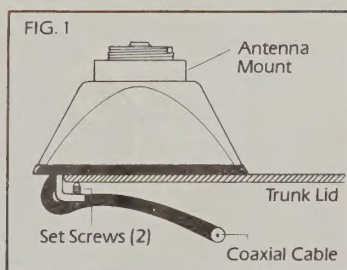


TEMPORARY MOUNTING INSTRUCTIONS

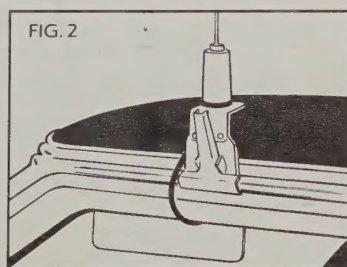
TLM SERIES

TRUNK LID MOUNT — For superior ground plane performance on a trunk lid.

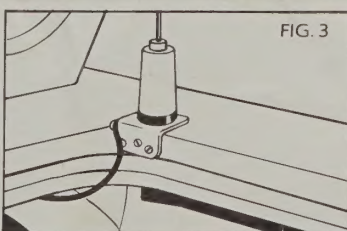
1. Center the TLM mount on the lip of the truck lid nearest the rear window.
2. Tighten the two set screws with the supplied allen wrench, sufficiently to break through the paint and establish a good ground connection (Fig. 1).



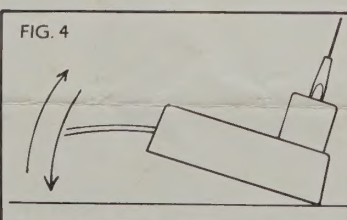
3. Route the coaxial cable from the trunk area to the radio. Install the PL-259 connector (supplied with TLM kits). Connect antenna cable to radio.



3. Route coaxial cable through the window to the radio. Install the PL-259 connector (supplied). Connect antenna cable to radio.



3. Route coaxial cable from the trunk area to the radio. Install the PL-259 connector (supplied). Connect antenna cable to radio.



4. Start the mount with the short side down. Use the antenna as a handle. Gently pivot the mount down until it snaps into place. (Fig. 4).
5. To remove mount, reverse the procedure.

The mount may be used on some vinyl roofs, with a reduction in holding power. Some loss in electrical capacitance will occur which may upset the operation of the antenna at some frequencies.

GC SERIES

GUTTER CLAMP MOUNT — Provides a positive ground plane for full antenna efficiency.

1. Attach Larsen NMO Kūlrod antenna to GC mount. Tighten firmly but do not use excess pressure.
2. Clamp mount to the side gutter of your car or truck (Fig. 2).

TMB SERIES

TRUNK GUTTER MOUNT — Simple installation with a stainless steel "L" bracket.

1. Position Larsen Trunk Gutter Mount on inside of the trunk gutter or the engine hood as shown (Fig. 3).
2. Tighten three stainless steel self-tapping screws with supplied allen wrench.

MM SERIES

MAGNETIC MOUNT — Super Hold with minimal chance of scratching painted surfaces.

1. Thoroughly clean and remove all dust and gritty material from the surface upon which the mount is to be placed, and from the aluminum surface of the mount.
2. Place short end of the mount forward to provide the greatest resistance to wind and obstructions.
3. Do not slide the mount once it is in place. Sliding would greatly increase the risk of scratching the painted surface.



Larsen Antennas

IN U.S.A.:
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P.O. Box 1799
Vancouver, W/A 98668
Phone 206-573-2722

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IN CANADA:
Canadian Larsen Electronics, Ltd.
149 West 6th Avenue
Vancouver, B.C. V5Y 1K3
Phone 604-872-8517



1009-0885
Rev. A

Larsen®, Kūlrod® and Kūlduckie® are registered trademarks of Larsen Electronics, Inc., U.S.A.

In the United States some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

Larsen will not, however, be responsible for any incidental or consequential damages due to failure of a Larsen Antenna under this warranty or any implied warranty.

Larsen will repair or replace, without charge, any Larsen Antenna which fails within six months of the purchase date to meet this warranty. Excluded, of course, is failure due to misuse such as striking solid or foreign objects (trees, buildings, overhangs, doorways, etc.), improper installation and application of power in excess of specified ratings. Larsen will be free from defects in materials and workmanship and will perform to its specified ratings (published specifications) warrant to every user of a Larsen Antenna that it will perform Larsen Electronics, Inc. and Canadian Larsen Electronics, Ltd.

Warranty

The Larsen® No Nonsense Full Six Month

CONGRATULATIONS!

CUTTING THE ROD

The Larsen Kūlrod whip is constructed of the highest grade 17-7PH stainless steel, to provide all-weather protection and maximum radiation efficiency. It is hard to cut. For best results use the Larsen CTR Rod Cutter, the edge of a grinding wheel, or the sharp corner of a file. Use the file to score the rod around its circumference so it may be snapped off with a pair of pliers.

MEASURING THE ROD LENGTH — LOW BAND AND HIGH BAND

Each Larsen Antenna whip in these frequencies is 49" long. Use the rule printed on the edge of this folder to measure the precise amount to cut off according to the cutting chart. You will then have the right whip length for the operating frequency.

Example: For 42 MHz operation, measure 2-1/2" with rule from the base end and cut off. The remaining 46-1/2" whip length will be correct for 42 MHz.

MEASURING THE ROD LENGTH — UHF ANTENNAS

The dimensions shown on the cutting chart are for the rod **below** the phasing coil. The rod **above** this coil is correct as it comes from the factory. **Do not change this upper rod.** The rod length indicated on the chart refers to the length of the rod from the bottom of the phasing coil to the end of the rod. Be sure to be precise for best results.

GROUND PLANE REQUIREMENTS

Larsen Kūlrod Antennas work against a suitable ground plane. Adequate reflected power may be had with a single ground element as small as 19" long and 1/2" wide. However, you can improve performance by making the ground plane larger.

ANTENNA LOCATION

The best location for a mobile antenna is on the vehicle's roof top. Next best is the rear fender. In this case you can minimize shadowing by the forward part of the car by mounting the antenna well to the rear. A third option is the trunk lid.

CAUTION

Under some conditions, low band antennas (27 to 54 MHz) on a trunk lid can result in an undesirable resonance with excessively high VSWR at some frequencies.

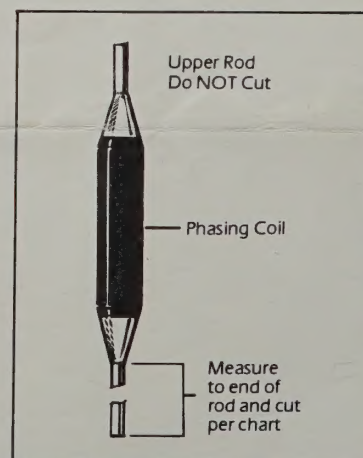
ADJUSTING TO FREQUENCY

Just cut the rod to the correct length for the operating frequency (see cutting chart).



SHOCK SPRING

Larsen's narrow diameter shock spring is made of electropolished stainless steel and is positively shocked to keep performance loss to an absolute minimum. Shock springs are standard on 800 MHz gain antennas and optional for VHF and UHF antennas. Rod cutting information is provided for with-spring and without-spring options.



NMO PERMANENT MOUNTING INSTRUCTIONS

1. Requires a 3/4" (19 mm) hole in the vehicle. Use of hole saw is the preferred method in most cases.

2. Remove any burrs, particularly on the under side of the hole. Also be sure to remove paint in a narrow ring around the hole. Metal to metal contact between the vehicle and mount is essential for best performance.

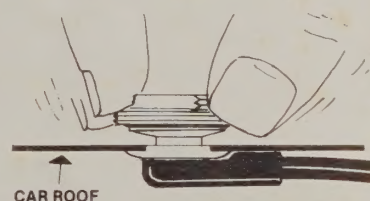
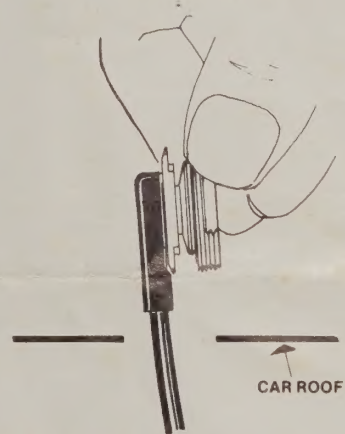
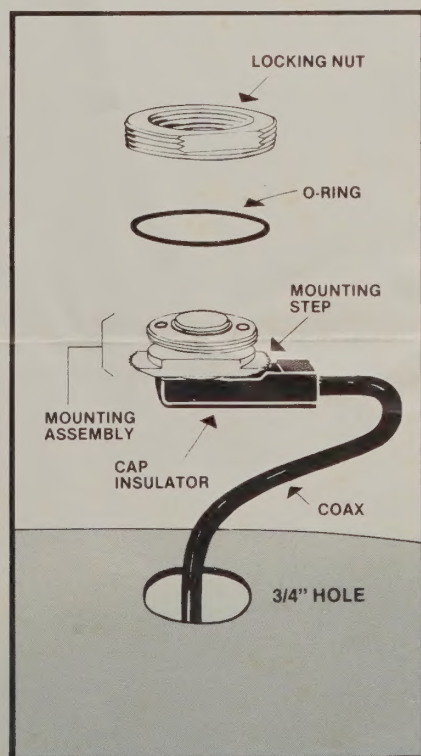
3. Feed the coax and serrated part of the mount (Mounting Assembly) through the hole. This is done more easily if the Locking Nut is screwed on to the Mounting Assembly about a turn-and-a-half.

4. Pulling up on the Locking Nut, jiggle the Mounting Assembly. The mount step on the Mounting Assembly will slip into proper alignment in the hole. Still pulling upwards, tighten down on the Locking Nut until the mount is finger tight. Be sure the "O" ring on the underside of the Locking Nut is properly seated.

5. Using a spanner wrench or long nose pliers to hold the Mounting Assembly, and an adjustable or open end wrench on the Locking Nut, tighten firmly. Excessive tightening is not necessary or desirable.

6. Attaching Antenna to Mount

Remove antenna rod assembly and chromed coupling nut leaving Locking Nut and "O" ring in place. Install Larsen NMO loading coil and tighten securely by hand using firm grip.



ROD CUTTING CHARTS FOR NMO SERIES ANTENNAS

QUARTER WAVE

Oper. Freq.	Rod Length (Inches)	(cm.)
NMOQ-52		
52 MHz	54-1/2"	138.43
54 MHz	53"	134.62
56 MHz	52"	132.08
58 MHz	51"	129.54
60 MHz	49-1/2"	125.73
62 MHz	47"	119.38
64 MHz	45-1/2"	115.57
66 MHz	44-1/4"	112.395
68 MHz	43-1/2"	110.49
70 MHz	42-1/4"	107.315
72 MHz	41"	104.14
74 MHz	40"	101.6
76 MHz	39"	99.06
78 MHz	38"	96.52
80 MHz	37"	93.98
82 MHz	36"	91.44
84 MHz	35"	88.9
86 MHz	34"	86.36
88 MHz	33"	83.82
NMOQ-88		
88 MHz	33"	83.82
90 MHz	32-1/4"	81.915
92 MHz	31-1/2"	80.01
94 MHz	30-1/2"	77.47
96 MHz	29-1/2"	74.93
98 MHz	29"	73.66
100 MHz	28-1/2"	72.39
102 MHz	27-1/2"	69.85
104 MHz	26-3/4"	67.945
106 MHz	26"	66.04
108 MHz	25-3/4"	65.405
110 MHz	25-3/8"	64.452
112 MHz	25"	63.5
114 MHz	24-1/2"	62.23
116 MHz	24-1/4"	61.595
118 MHz	24"	60.96
120 MHz	23-1/2"	59.69
122 MHz	23"	58.42
124 MHz	22-1/2"	57.15
126 MHz	22"	55.88
128 MHz	21-3/4"	55.245
130 MHz	21-1/4"	53.975
132 MHz	21"	53.34
134 MHz	20-3/4"	52.705
136 MHz	20"	50.8
NMOQ-		
140 MHz	19-1/4"	48.895
144 MHz	18-3/4"	47.625
150 MHz	18"	45.72
155 MHz	17-1/2"	44.45
158 MHz	16-3/4"	42.545
161 MHz	16-5/8"	42.228
164 MHz	16-3/8"	41.593
168 MHz	16-1/8"	40.958
172 MHz	15-3/4"	40.005
176 MHz	15-1/2"	39.37
210 MHz	12-5/8"	32.068
215 MHz	12-3/8"	31.433
220 MHz	12-1/4"	31.115
225 MHz	11-7/8"	30.163
230 MHz	11-1/2"	29.21
400 MHz	6-1/8"	15.558
410 MHz	6"	15.24
420 MHz	5-7/8"	14.923
430 MHz	5-3/4"	14.605
440 MHz	5-5/8"	14.288
450 MHz	5-1/2"	13.97
460 MHz	5-1/4"	13.335
470 MHz	5-1/8"	13.018
480 MHz	5"	12.70
490 MHz	4-7/8"	12.383
500 MHz	4-3/4"	12.065

LOW BAND

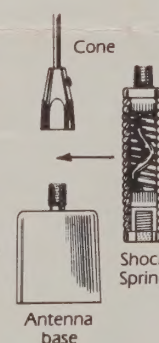
Oper. Freq.	Rod Length (Inches)	(cm.)
27-31 MHz Range		
26.5 MHz	49"	124.46
27.0 MHz	48"	121.92
28.0 MHz	45"	114.30
29.0 MHz	40"	101.60
30.0 MHz	38"	96.52
30-35 MHz Range		
30.0 MHz	49"	124.46
31.0 MHz	46"	116.84
32.0 MHz	43"	109.22
33.0 MHz	40"	101.60
34.0 MHz	37"	93.98
35.0 MHz	34"	86.36
34-40 MHz Range		
34.0 MHz	49"	124.46
35.0 MHz	47"	119.38
36.0 MHz	44-1/2"	113.03
37.0 MHz	42"	106.68
38.0 MHz	40"	101.60
39.0 MHz	37-1/2"	95.25
40.0 MHz	35-1/2"	90.17
40-50 MHz Range		
40.0 MHz	49"	124.46
42.0 MHz	46-1/2"	118.11
44.0 MHz	42-1/2"	107.95
46.0 MHz	40"	101.60
48.0 MHz	37"	93.98
50.0 MHz	35"	88.90
47-54 MHz Range		
47.0 MHz	49"	124.46
48.0 MHz	47-1/2"	120.65
49.0 MHz	46-1/2"	118.11
50.0 MHz	45-1/2"	115.57
51.0 MHz	44-1/4"	112.395
52.0 MHz	43-1/2"	110.49
53.0 MHz	42-1/2"	107.95
54.0 MHz	41-1/2"	105.41

HIGH BAND

Oper. Freq.	Rod Length (Inches)	(cm.)
144-174 MHz Range		
144 MHz	49"	124.46
146 MHz	48-3/4"	123.825
148 MHz	48-1/2"	123.19
150 MHz	46-3/4"	118.745
152 MHz	46"	116.84
154 MHz	45-1/2"	115.57
156 MHz	45"	114.30
158 MHz	44"	111.760
160 MHz	43-1/4"	109.855
162 MHz	42-3/4"	108.585
164 MHz	42"	106.680
166 MHz	41-1/4"	104.775
168 MHz	40-3/4"	103.505
170 MHz	40"	101.60
172 MHz	39-1/2"	100.330
174 MHz	39"	99.060
200-265 MHz Range		
200 MHz	37-1/2"	95.250
205 MHz	36-1/2"	92.710
210 MHz	35"	88.90
215 MHz	33-3/4"	85.725
220 MHz	32"	81.280
225 MHz	31"	78.740
230 MHz	30"	76.20
235 MHz	29-1/2"	74.930
240 MHz	29"	73.660
245 MHz	28"	71.120
250 MHz	27-1/4"	69.215

New NMO-150 Antennas with Shock Spring Option

This cutting chart applies only to NMO-150 antennas designed to accept a shock spring. Note these antenna elements now come with a metal cone that screws either directly on the base or on the shock spring (see adjacent drawing). The cutting lengths are based on inserting the rod as far as possible into the spring or base loading coil. This gives the user approximately 3/4" of adjustment in case the rod was inadvertently cut too short.



Oper. Freq.	W/O Spring (Inches)	(cm.)	With Spring (Inches)	(cm.)
144-174 MHz Range				
144 MHz	49"	124.46	46"	116.84
146 MHz	48-1/2"	123.19	45-1/8"	114.62
148 MHz	47-3/8"	120.333	44-1/8"	112.08
150 MHz	46-5/8"	118.43	43-1/8"	109.54
152 MHz	45-5/8"	115.89	42-1/4"	107.32
154 MHz	44-7/8"	113.98	41-1/2"	105.41
156 MHz	44-1/8"	112.08	40-5/8"	103.19
158 MHz	43-3/8"	110.173	39-3/4"	100.97
160 MHz	42-3/4"	108.59	39"	99.06
162 MHz	41-3/4"	106.05	38"	96.52
164 MHz	41"	104.14	37-1/8"	94.30
166 MHz	40-1/4"	102.24	36-1/2"	92.71
168 MHz	39-1/2"	100.33	35-1/2"	90.17
170 MHz	39"	99.06	34-3/4"	88.27
172 MHz	38-3/4"	98.43	34-1/8"	86.68
174 MHz	38-1/2"	97.79	33-1/2"	85.09

UHF BAND

Oper. Freq.	W/O Spring (Inches)	(cm.)	With Spring (Inches)	(cm.)
406-420 MHz Range				
405 MHz	11-7/8"	30.163	10-1/8"	25.717
410 MHz	11-1/4"	28.575	9-1/2"	24.130
415 MHz	10-5/8"	26.987	9-1/8"	23.1775
420 MHz	10-1/8"	25.717	8-3/8"	21.2725
420-440 MHz Range				
420 MHz	12"	30.48	10-1/8"	25.718
425 MHz	11-1/2"	29.21	9-5/8"	24.448
430 MHz	10-7/8"	27.623	9-1/8"	23.178
435 MHz	10-3/8"	26.353	8-5/8"	21.908
440 MHz	10-1/8"	25.718	8-3/8"	21.273
440-460 MHz Range				
440 MHz	11-3/8"	28.892	9-5/8"	24.447
445 MHz	10-7/8"	27.622	9-1/8"	23.177
450 MHz	10-3/8"	26.352	8-3/4"	22.225
455 MHz	10"	25.40	8-1/4"	20.955
460 MHz	9-5/8"	24.447	7-7/8"	20.00
450-470 MHz Range				
450 MHz	10-7/8"	27.622	9-1/8"	23.177
455 MHz	10-1/8"	25.717	8-5/8"	21.907
460 MHz	9-3/4"	24.765	8-1/4"	20.955
465 MHz	9-1/2"	24.130	7-7/8"	20.00
470 MHz	9-1/8"	23.177	7-1/2"	19.050
470-490 MHz Range				
470 MHz	9-7/8"	25.082	8-1/4"	20.955
475 MHz	9-1/2"	24.130	7-3/4"	19.685
480 MHz	9-1/8"	23.177	7-3/8"	18.732
485 MHz	8-7/8"	22.542	7-1/4"	18.415
490 MHz	8-5/8"	21.907	7-1/8"	18.097
490-512 MHz Range				
490 MHz	9-5/8"	24.447	7-3/4"	19.685
495 MHz	9-3/8"	23.812	7-1/2"	19.050
500 MHz	9"	22.860	7-1/8"	18.097
505 MHz	8-3/4"	22.225	6-3/4"	17.145
512 MHz	8-1/4"	20.955	6-1/2"	16.51

800 MHz Band

Larsen 800 MHz antennas are cut to be resonant at 805-855 MHz. No further cutting is necessary.

The Larsen Fixed Base Kūlrod® Antenna Model FB1-136 for 136 to 230 MHz

Adjustment for a Specific Operating Frequency

The Larsen Model FB1-136 Fixed Base Kūlrod Antenna is designed to cover a wide range of frequencies and to be easily adjusted for any one operating frequency. This adjusting is done on the ground before mounting the antenna on the tower or mast. When properly assembled and adjusted the FB1-136 will give a 3.6 db gain over a Quarter Wave antenna and will have a VSWR of less than 1.5/1 over a 5 MHz band width at any frequency setting.

Follow These 3 Steps:

A Following the chart shown here, set the length of the heavy duty aluminum lower section for the operating frequency. Measure from the lower loop of the phasing rod to the bottom of the base mount (see illustration). Tighten the rod clamp securely.

B Again using the chart, set the length of the phasing rod measuring from the aluminum lower section to the vertical part of the rod. Tighten the allen head set screws using the supplied wrench.

C Measure the length of the Kūlrod whip required for your operating frequency (from chart) and cut to length specified. Allowance has been made in the chart for seating the rod in the upper insulator. Tighten the set screw firmly using the supplied allen wrench.

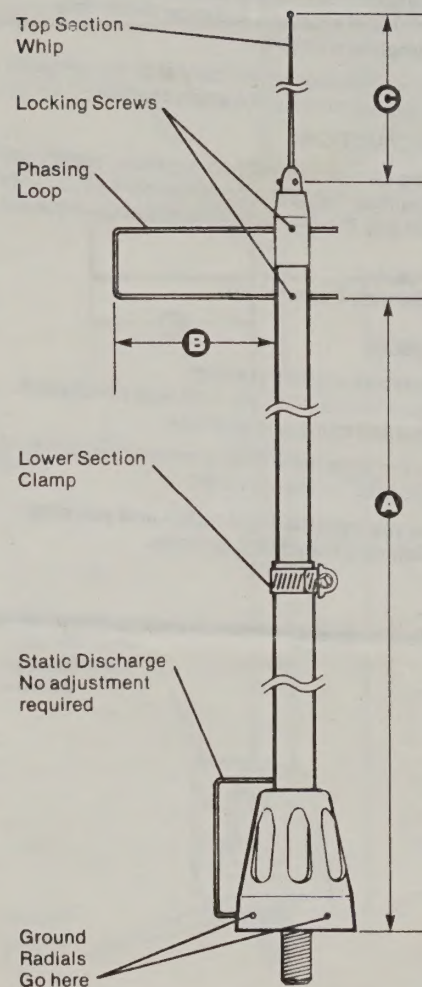
This completes the antenna adjustment for any operating frequency from 136 to 230 MHz. Now attach the heavy duty mounting bracket and the ground radials plus the coax connector and the Larsen FB1-136 Kūlrod Antenna is ready for mounting on the mast or tower. For such, mounting clamps that will work with any mast from 3/4" to 1-1/2" in diameter are supplied.

Larsen
Electronics, Inc.

*Pioneers in communications antennas that let you
HEAR the difference.*

11611 N.E. 50th Ave.
P.O. Box 1686
Vancouver, WA. 98668

* Kūlrod is a Registered Trademark of Litho U.S.A.
Larsen Electronics, Inc. Form 7805 NW 5M 8/79



Adjustment Chart Larsen FB1-136 Kūlrod® Antenna All Dimensions in Inches			
Operating Frequency	A Lower Section	B Phasing Rod	C Top Rod Section
136 MHz	40	8	54
138 "	39-1/2	7-3/4	53
140 "	39-1/4	7-5/8	51
144 "	39-1/16	7-9/16	47-7/8
148 "	37-15/16	7-5/16	46-9/16
152 "	36-15/16	7-1/16	45-3/8
156 "	36-1/16	6-13/16	44-3/16
160 "	35-1/16	6-1/4	43
164 "	34-1/8	6	42
168 "	33-9/16	5-3/8	40-1/2
172 "	32-3/4	5-1/8	40
176 "	32-1/8	5	39-3/16
180 "	31-3/16	4-7/8	38
184 "	30-1/2	4-3/4	37-7/16
188 "	29-3/4	4-1/2	36-5/8
192 "	29-1/4	4	35-7/8
196 "	28-3/4	3-3/4	35
200 "	27-3/4	3-5/8	34-1/4
204 "	27-1/2	3-1/2	33-3/4
208 "	26-1/2	3-3/8	33
212 "	26-1/4	3	32
216 "	25-1/4	2-7/8	31-1/8
220 "	25-1/8	2-3/4	30-3/4
224 "	25	2-5/8	30-1/2
228 "	24-3/4	2-1/4	29-3/4
232 "	24-1/4	2	29-1/4

The Larsen No Nonsense Full Six Month WARRANTY

Larsen Electronics, Inc. warrants to every user of a Larsen that it will perform to its specified ratings (published specifications) and will be free from defects in materials and workmanship. Larsen will repair or replace, without charge, any Larsen Antenna which fails within six months of the purchase date to meet this warranty. Excluded, of course, is failure due to misuse such as striking solid or foreign objects (trees, buildings, overhangs, doorways, etc.), improper installation and application of power in excess of specified ratings.

Larsen will not, however, be responsible for any incidental or consequential damages due to failure of a Larsen Antenna under this warranty or any implied warranty.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

CLAIMS INSTRUCTIONS

In order to obtain performance under the Larsen Warranty obligation, return the antenna to the factory. If you desire, you may request a postage-paid "Warranty Return Label", in which case Larsen will pay the postage. Make return shipment

to: Larsen Electronics, Inc.
Attn: Customer Service Department
P.O. Box 1686
Vancouver, WA 98663

Include with the antenna a note detailing the failure symptoms and indicate where and when the unit was purchased.
Be sure to include your full name and address.

Upon arrival at the Larsen factory the antenna will be promptly repaired or replaced and returned to you postpaid.

IMPORTANT: This warranty gives you specific legal rights and you may have other rights which vary from state to state.

The Larsen Fixed Base Kūlrod® Antenna Model FB1-136 for 136 to 230 MHz

Adjustment for a Specific Operating Frequency

The Larsen Model FB1-136 Fixed Base Kūlrod Antenna is designed to cover a wide range of frequencies and to be easily adjusted for any one operating frequency. This adjusting is done on the ground before mounting the antenna on the tower or mast. When properly assembled and adjusted the FB1-136 will give a 3.6 db gain over a Quarter Wave antenna and will have a VSWR of less than 1.5/1 over a 5 MHz band width at any frequency setting.

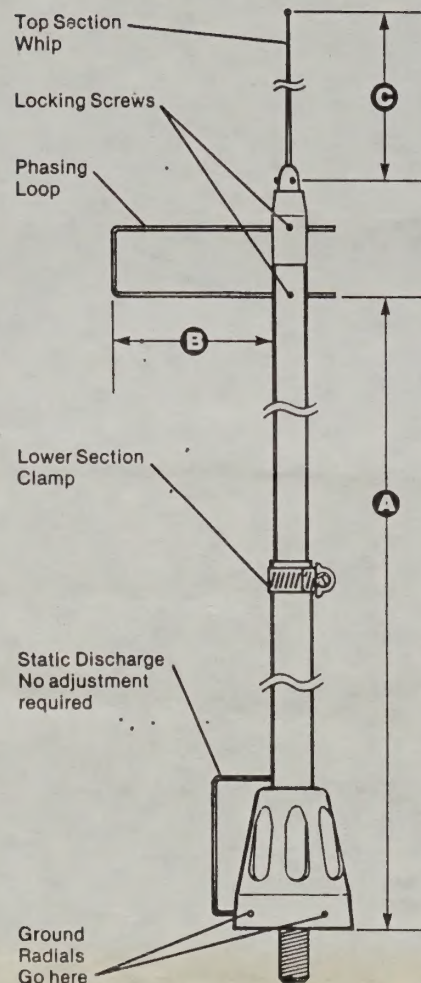
Follow These 3 Steps:

A Following the chart shown here, set the length of the heavy duty aluminum lower section for the operating frequency. Measure from the lower loop of the phasing rod to the bottom of the base mount (see illustration). Tighten the rod clamp securely.

B Again using the chart, set the length of the phasing rod measuring from the aluminum lower section to the vertical part of the rod. Tighten the allen head set screws using the supplied wrench.

C Measure the length of the Kūlrod whip required for your operating frequency (from chart) and cut to length specified. Allowance has been made in the chart for seating the rod in the upper insulator. Tighten the set screw firmly using the supplied allen wrench.

This completes the antenna adjustment for any operating frequency from 136 to 230 MHz. Now attach the heavy duty mounting bracket and the ground radials plus the coax connector and the Larsen FB1-136 Kūlrod Antenna is ready for mounting on the mast or tower. For such, mounting clamps that will work with any mast from 3/4" to 1-1/2" in diameter are supplied.



Adjustment Chart Larsen FB1-136 Kūlrod® Antenna All Dimensions in Inches			
Operating Frequency	A Lower Section	B Phasing Rod	C Top Rod Section
136 MHz	40	8	54
138 "	39-1/2	7-3/4	53
140 "	39-1/4	7-5/8	51
144 "	39-1/16	7-9/16	47-7/8
148 "	37-15/16	7-5/16	46-9/16
152 "	36-15/16	7-1/16	45-3/8
156 "	36-1/16	6-13/16	44-3/16
160 "	35-1/16	6-1/4	43
164 "	34-1/8	6	42
168 "	33-9/16	5-3/8	40-1/2
172 "	32-3/4	5-1/8	40
176 "	32-1/8	5	39-3/16
180 "	31-3/16	4-7/8	38
184 "	30-1/2	4-3/4	37-7/16
188 "	29-3/4	4-1/2	36-5/8
192 "	29-1/4	4	35-7/8
196 "	28-3/4	3-3/4	35
200 "	27-3/4	3-5/8	34-1/4
204 "	27-1/2	3-1/2	33-3/4
208 "	26-1/2	3-3/8	33
212 "	26-1/4	3	32
216 "	25-1/4	2-7/8	31-1/8
220 "	25-1/8	2-3/4	30-3/4
224 "	25	2-5/8	30-1/2
228 "	24-3/4	2-1/4	29-3/4
232 "	24-1/4	2	29-1/4

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